



US006205260B1

(12) **United States Patent**
Crinon et al.

(10) **Patent No.:** **US 6,205,260 B1**
 (45) **Date of Patent:** **Mar. 20, 2001**

(54) **SPRITE-BASED VIDEO CODING SYSTEM
 WITH AUTOMATIC SEGMENTATION
 INTEGRATED INTO CODING AND SPRITE
 BUILDING PROCESSES**

(75) Inventors: **Regis J. Crinon; Muhammed Ibrahim
 Sezan**, both of Vancouver, WA (US)

(73) Assignee: **Sharp Laboratories of America, Inc.**,
 Camas, WA (US)

(*) Notice: Subject to any disclaimer, the term of this
 patent is extended or adjusted under 35
 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **08/999,103**

(22) Filed: **Dec. 29, 1997**

Related U.S. Application Data

(60) Provisional application No. 60/034,558, filed on Dec. 30,
 1996.

(51) Int. Cl.⁷ **G06K 9/36; H04N 9/74;**
H04N 1/387; G06T 11/180

(52) U.S. Cl. **382/284; 382/232; 382/236;**
345/435; 348/584; 348/586; 348/598; 358/426;
358/450

(58) Field of Search **382/232, 236,**
382/284, 240; 345/202, 115, 435; 348/9,
19, 384, 584, 586, 598; 358/426, 450

(56) References Cited

U.S. PATENT DOCUMENTS

5,649,032	*	7/1997	Burt et al.	382/284
5,686,956	*	11/1997	Oh et al.	348/19
5,778,098	*	7/1998	Lee et al.	382/236
5,896,176	*	4/1999	Das et al.	348/416
5,943,445	*	8/1999	Dufaux	382/236
5,956,026	*	9/1999	Ratakonda	345/328
5,999,662	*	12/1999	Burt et al.	382/284
6,037,988	*	3/2000	Gu et al.	348/416

OTHER PUBLICATIONS

Dufaux "Results for Video Coding using Dynamic Sprite
 (Core Experiment N3)", pp. 10-25, ISO/IEC JTC1/SC29/
 WG11, MPEG96, Nov. 1996.*

Dufaux "Background Mosaicking", pp. 1-9, ISO/IEC JTC1/
 SC29/WG11, MPEG96, Jan. 1996.*

Irani, et al "Mosaic Based Representations of Video
 Sequences and Their Applications", IEEE, pp. 605-611,
 1995.*

Tannenbourn, et al "Evaluation of A Mosaic Based Approach
 To Video Compression", IEEE, pp. 1213-1215, 1996.*

Dufaux, et al "Background Mosaicking For Low Bit Rate
 Video Coding", IEEE, pp. 673-676, Sep. 1996.*

* cited by examiner

Primary Examiner—Phuoc Tran

Assistant Examiner—Daniel G. Mariam

(74) Attorney, Agent, or Firm—Marger, Johnson &
 McCollom, P.C.

(57)

ABSTRACT

A sprite-based coding system includes an encoder and
 decoder where sprite-building is automatic and segmenta-
 tion of the sprite object is automatic and integrated into the
 sprite building as well as the coding process. The sprite
 object is distinguished from the rest of the video objects on
 basis of its motion. The sprite object moves according to the
 dominant component of the scene motion, which is usually
 due to camera motion or zoom. Hence, the sprite-based
 coding system utilizes dominant motion, to distinguish
 background images from foreground images. The sprite-
 based coding system is easily integrated into a video object-
 based coding framework such as MPEG-4, where shape and
 texture of individual video objects are coded separately. The
 automatic segmentation integrated in the sprite-based cod-
 ing system identifies the shape and texture of the sprite
 object.

10 Claims, 11 Drawing Sheets

